

## GENERAL NOTES

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### IDENTIFICATION OF THE LARVAE DESCRIBED BY CRUMB AS *CUCULLIA* “SPECIES N<sup>o</sup> 8” AND *CUCULLIA SPEYERI* RACE *DORSALIS* (NOCTUIDAE, CUCULLIINAE)

**Additional key words:** life cycle, host plant, purple aster, *Machaeranthera*.

The identities of the larvae of *Cucullia dorsalis* Smith and *Cucullia speyeri* Linter have remained in question for some time. In his cuculliine monograph, Poole (1995) stated that “the larva of *dorsalis* has not been described” even though he considered the possibility that Crumb's (1956:61) “*Cucullia* #8” may be this species. The uncertainty concerning the identity of this larva is complicated up by the description made by Crumb of another larva, under the name of *C. speyeri* race *dorsalis*. The unique adult obtained from this larva was a female preventing identification by genitalic examination. Concerning *C. speyeri*, Poole (1995) stated: “the larva has not been unequivocally described.... There are larvae from Illinois that have been reared from *Conyza canadensis* (L.) Cronq. (Asteraceae)”. Poole then offered a short description of these larvae. However, Poole's description is not completely consistent with that given by Crumb under the name *C. speyeri* race *dorsalis*. Handfield (1995), citing Crumb, states the food-plant of *C. speyeri* is *C. canadensis*, implicitly recognizing, that the species described as *C. speyeri* race *dorsalis* is *C. speyeri*. Here we present rearing data to help clarify this situation.

In August 1992, near Cedar City, Utah, we found four brightly colored mature cuculliine larvae on a flowering blue-violet aster which we later identified as *Machaeranthera canescens* (Pursh) Gray (Asteraceae). Our larvae strongly differed from those described by Crumb (1956) as *C. speyeri* race *dorsalis*, and more closely resembled larvae of the three taxa “*Cucullia* sp. No. 8,” *C. laetifica* (Linter) and *C. alfarata* (Strecker). These latter three taxa all have a last instar with red/orange (sometimes yellow) middorsal and subventral stripes, and variable black markings on a white or green ground color. The subventral stripes appear continuous in all three taxa. The middorsal stripe is continuous only in *C. alfarata*, being broken into separate spots by black transverse stripes in “*Cucullia* sp. No 8,” and *C. laetifica*, as well as in our Cedar City larvae (a photo of a *C. alfarata* larva is available at <http://troyb.com/photo/gallery/>). We exclude *C. alfarata* as a possibility for our larvae because that species is south-eastern in distribution (Poole 1995). We felt our larvae were not *C. laetifica* because they had a white rather than green ground color, a different shape of the black markings surrounding the middorsal stripe, and

fed mainly on *M. canescens* (the foodplant reported by Crumb for his *Cucullia* No. 8 collected near Tieton, central Washington) rather than on *C. laetifica* food plants. *C. laetifica* is recorded, according to Crumb 1956, on *Chrysothamnus* (Asteraceae), *Boerhavia* (Verbenaceae), and *Hedera* (Araliaceae) and according to Poole 1995 on *Baccharis neglecta* Britton (Asteraceae). We obtained two adults in late August and early September 1992 from the four larvae, showing that our species was double brooded. However, at the time, we were unable to identify the adult moths with certainty using the figures in Hampson (1906) and Seitz (1919-1944).

We returned in August 1993 to search again for more larvae. We found them in abundance in four north-western states, including: Utah (Brighton; Cedar City; Dixie National Forest; Rte. 211 nr. fork leading to Canyon Land National Park), Colorado (Dove Creek; Clear Creek River nr. Idaho Springs; Estes Park), Wyoming (Rte. 187 N of Rock Springs; Landers; Roverton), and Montana (20 km. SW of Missoula). At low elevation the larvae were feeding on *M. canescens* and similar asters. At higher elevations (2500–3000 m) in Utah they were feeding on low growing plants tentatively determined by us as *Erigeron asperugineus* (D. C. Eat.) Gray (Asteraceae) (the online USDA Plants Database at <http://plants.usda.gov> only reports *E. asperugineus* from Nevada, Idaho, and Montana). Similarly, *M. canescens* is not reported from Washington in this database but is cited by Crumb (1956) as occurring at Tieton, Washington. It is interesting to note that Poole (1995) lists the following food plants for *C. dorsalis*: *Helianthus* sp. (Asteraceae) and *M. shastensis* Gray, a synonym of *M. canescens* according to the USDA plants database. All these food plants are similar in the sticky properties of their flower buds. In Colorado, Wyoming, and Montana, the only other lepidopteran species we found on *M. canescens* included a species of *Cucullia* in the *asteris* group and an unidentified heliothine, neither of which were common.

#### DESCRIPTION OF *C. DORSALIS* AND *C. SPEYERI* LARVAE

***Cucullia dorsalis*:** Using information provided by J. D. Lafontaine and later confirmed in Poole's monograph, we were subsequently able to identify our



FIGS 1-9. Larvae of *Cucullia* species ordered sequentially from left to right, top to bottom: 1. *C. dorsalis* (lateral view), last instar, on *M. canescens* Cedar City (Utah, VIII-93). 2. *C. dorsalis* (dorsal view), last instar, Cedar City (Utah, VIII-93). 3. *C. dorsalis* (dorsal view), last instar, on *M. canescens*, (Central Washington, IX-02). 4. *C. dorsalis* (dorsal view), penultimate instar, 20 Km South West of Missoula, (Montana, IX-02). 5. *C. dorsalis* (lateral view), third instar, Cedar City (Utah, VIII-93). 6. *C. dorsalis* (lateral view), second instar, Cedar City (Utah, VIII-93). 7. *C. dorsalis* (enlarged dorsal view), last instar, Cedar City (Utah, VIII-93). 8. *C. speyeri* (lateral view), penultimate instar on *C. canadensis*, 10 Km West of Clarkston (Eastern Washington, VIII-93). 9. *C. speyeri* (dorsal view), penultimate instar on *C. canadensis*, 10 Km West of Clarkston (Eastern Washington, VIII-93).

August 1992 reared adults as *C. dorsalis*. Although we failed to locate larvae in 1993 at Crumb's original Tieton, Washington locality, we were successful on a subsequent trip in September 2002 along the Yakima River between Yakima and Ellensburg. Our work therefore confirms that Crumb's (1956) description of "*Cucullia* sp. No. 8" is in fact *Cucullia dorsalis*.

The ground color of the larva is white, with intricate black, red, and orange patterning, giving the larva a harlequin-like appearance. The typical form (Figs. 1, 3) of the last instar has a prominent dorsal stripe consisting of a succession of two orange-red spots on each abdominal segment followed by a smaller spot of the ground color partially invaded with yellow (Fig. 7); all the orange-red spots are separated from each other and from the previous segments by black markings which are wider on the sides creating an angled, sinuous longitudinal stripe. The result is a distinctive red/orange/yellow middorsal stripe. In the area between the black subdorsal stripe and the red subventral stripe (margined with black) there are two transverse black stripes on each segment, the second one including the spiracles, which are black. Generally, due to the absence of yellow shading, the subventral stripe is a more intense red/orange color than the middorsal one. Color variants occur in which the dorsal stripe is either yellow (Fig. 2) or red (Fig. 4) with the latter appearing in our Washington samples. In the first instars, the stripes are yellow/ochre (instead of red/orange) and two or three additional thin longitudinal black lines combine with the vertical lines to create a conspicuous reticulation (Figs. 5, 6), a feature that is absent in the last instar. The subdorsal black line is not as prominent as in the last instar.

***Cucullia speyeri*:** We also offer additional information on the identity of the larva of *C. speyeri*. In 1993, we collected fourth instar cuculliine larvae (Fig. 8, 9) in eastern Washington (10 Km W of Clarkston) on *Conyza canadensis*. The appearance of these larvae is consistent with the description Crumb (1956) gave of a fifth instar larva from Puyallup, in Western Washington, under the name *C. speyeri* race *dorsalis*.

There are two lemon-yellow longitudinal stripes on a white ground color: the first is middorsal and discontinuous, consisting of two yellow spots on each segment separated by two irregular transversal black lines; the second, located under the black spiracles, is continuous and sinuous. We did not obtain adults from these 1993 rearings, so it was not possible to positively identify the larvae as *C. speyeri*. However, now that the larva of *C. dorsalis* is known, it becomes clear that the species described by Crumb (1956) as *C. speyeri* race *dorsalis* is true *C. speyeri* and not *C. dorsalis*, which was

formerly treated as the western subspecies of *C. speyeri* (see Forbes 1954).

At first glance the description of the larva given by Crumb does not seem completely consistent with that of Poole (1995) who describes USNM specimens of *C. speyeri* collected in Illinois and reared on *C. canadensis* with the statement "the general larva pattern is a complicated series of yellow markings on a *black background*" (our italics). Our Figures 8 and 9 show clearly (for the fourth instar) a white ground color in agreement with Crumb's description of the fifth instar. We think that a "*lapsus calami*" may be the origin of this difference since in the same text Poole says "The dorsal (yellow) triangles are extensively connected and the *black occurs as isolated patches* running in a dorsoventral direction" (our italics). However, this may also suggest that the larvae collected in Illinois had heavier black markings than those collected in Washington. There is also another difference quoted by Poole concerning the color of the prolegs which are black according to Crumb but "black with large yellow patch on the apex of leg" according to Poole. Additional material of *C. speyeri* will be needed to determine if there is any geographical variation in the larvae, or if individual variation is greater than we observed in our material.

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